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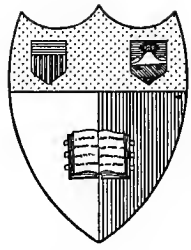

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INVESTIGATION AND ANALYSIS

OF THE

PRODUCTION, TRANSPORTATION INSPECTION AND DISTRIBUTION

OF

MILK AND CREAM

IN

NEW ENGLAND

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Investigation and Analysis

of the

Production, Transportation Inspection and Distribution of Milk and Cream in New England

ISSUED BY THE
Boston Chamber of Commerce
July, 1915

PREPARED FOR THE

COMMITTEE ON AGRICULTURE

OF THE @ 21334

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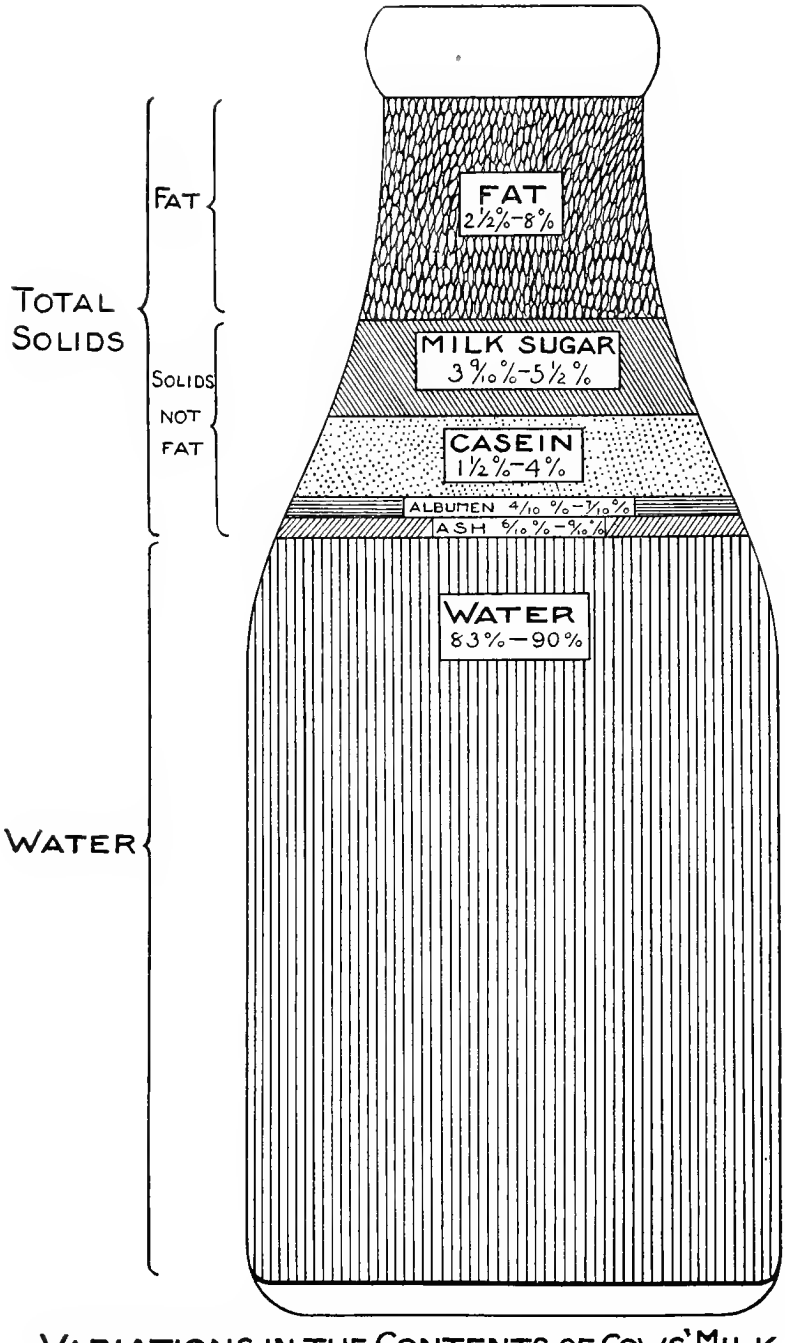

VARIATIONS IN THE CONTENTS OF COWS' MILK

THE REPORT AS A UNIT

THIS report intentionally has no index, and the reader is earnestly warned against reading only one particular part and considering it to the neglect of the other related parts. Every attempt has been made to condense the report into fewer pages. It is admittedly long, but necessarily so, dealing as it does with a great and widespread industry involving so many problems. It records an exhaustive survey of every phase of the industry in its relation to the whole. Only by gaining a thorough understanding of all of the problems involved may the reader hope to secure an accurate idea of the existing conditions in the entire industry, and how they may be improved.

REASONS FOR THIS INVESTIGATION

It has been apparent for some time that the production and distribution of milk in the New England States is not on a sound economic basis, and that there is something radically wrong with the way in which this important industry is now being conducted. It is obvious that the opportunities in the industry are far from being fully realized.

Milk has always been a staple article of consumption with all classes, and is among the best and cheapest foods on the market. The large cities of southern New England would naturally look to the adjoining territory for their supply. This territory (northern and central New England) is well able to support a flourishing dairy industry — and dairying should naturally be the largest single branch of New England agriculture, our greatest single industry.

Generally speaking the per capita consumption of milk in the United States has been steadily increasing; but in certain districts of New England the per capita consumption has been decreasing for the past ten years, and the amount required has been drawn from a larger and larger territory, and from districts more and more remote.

In short, despite the increase in our urban population, the output of the principal agricultural industry in the immediate adjoining territory has declined. Country districts, which ought to be flourishing, are at a standstill. No one has appeared to understand the cause of the difficulty, or to have comprehensive ideas for its solution.

The Committee on Agriculture of the Boston Chamber of Commerce, in view of this situation and at the request of the New England Milk Producers Association (an

organization of about 2,000 New England farmers), has made this investigation in the hope of being able to throw a strong light upon the fundamental causes of the difficulty and of being able to work out suggestions for its solution. This investigation has been conducted in coöperation with the agricultural agencies of the various New England States. The Federal Department of Agriculture also has rendered assistance in the transportation features.

It appeared necessary, *first*, to obtain exact facts as to conditions now existing in New England regarding production, transportation, inspection, grading and distribution; *second*, to make a thorough analysis of this information, studying the methods adopted by railroads and cities elsewhere; *third*, to make, if possible, recommendations helpful in putting the industry on a sound basis.

The report has two divisions. The first outlines the present conditions in each phase of the industry, undertaking to give the reader a mental picture of how milk and cream are produced, transported, processed, inspected, graded and distributed, and giving the costs and principal problems connected therewith: the second contains comments and suggested recommendations.

PRESENT AND PAST CONDITIONS IN THE MILK AND CREAM INDUSTRY IN NEW ENGLAND

CONDITIONS TEN TO FIFTEEN YEARS AGO; PRODUCING TERRITORY, AND WHAT WAS DONE WITH THE PRODUCT

Butter and cheese factories.

Fifteen years ago, Maine had 72 creameries, New Hampshire 24, Vermont 240 (including about 30 cheese factories), Massachusetts 20, and Connecticut 19, which sent their entire product to market as butter or cheese.

Source of supply to Boston and other large cities.

Boston received its milk supply from a radius of 125 to 150 miles, and the other large cities in New England from their immediate vicinity. The sale of cream was only beginning; previous to this period it was a very small factor in the milk industry.

PRESENT CONDITIONS

Maine creameries.

To-day, 55 of the 72 creameries in Maine are owned by four companies which ship the greater part of their product as whole milk, cream and skim milk; making butter in the surplus season of the year only.

Creameries elsewhere in New England.

In New Hampshire and Vermont, from 60% to 75% of the creameries are owned by eight or ten dealers who are shipping the greater part of their product as whole milk, cream and skim milk, and are making butter of the surplus.

In Massachusetts and Connecticut there are about 30 creameries which are selling, for the most part, cream and butter, their output being small in comparison with the

big dairy sections of New Hampshire, Vermont, Maine and Quebec.

Creameries, etc., in Quebec. In the Province of Quebec, there are nearly 1,500 creameries and cheese factories, which are selling their product as cream, butter or cheese.

Eastern New York. In the eastern part of New York State, on the Fitchburg Division of the Boston & Maine Railroad and the Delaware & Hudson Railroad, there are now about six creameries or milk plants owned by two Boston dealers, who ship whole milk and cream to Boston.

Great growth in sale of cream. Since 1910 there has been a remarkable increase in the sale of cream not only for ice-cream but for general family use, in cooking, in serving fancy dishes in the hotels, restaurants, etc., and in candy manufacturing, until now the price paid for cream establishes largely the basis for the price paid for milk.

Source of milk supply. Metropolitan Boston receives about 20% of its milk supply locally and 80% from Maine, New Hampshire, Vermont, Eastern New York and Connecticut.

With the possible exception of eight or ten New England cities of over 100,000 population, all the cities and large towns receive their milk supply from local producers.

Cream supply. Metropolitan Boston receives its cream supply from Maine, New Hampshire, Vermont, Quebec and New York. All the other large cities and towns in New England receive their cream supply from about the same sources as Metropolitan Boston.

No duty on milk and cream. Previous to 1910 there was a duty on milk, cream and butter coming in from Canada. At present there is a duty on butter only. Milk and cream come in duty free.

ANALYSIS OF THE INDUSTRY AS IT IS TO-DAY

I. PRODUCTION

Analysis of Evidence Secured at Public Milk Hearings held throughout the Six New England States

Parties co-operating with the Chamber.

In coöperation with the Federal Department of Agriculture, the State Departments of Agriculture, the State Agricultural Colleges, the State Granges, the State Dairymen's Association and county agents of each state respectively, sixteen hearings were held throughout New England in the latter half of 1914.

Centers in which hearings were held by the committee.

Putnam, Conn. . .	August 26
Hawleyville, Conn.	August 27
Providence, R. I. .	September 1
Portsmouth, N. H.	September 16
Concord, N. H. .	September 17
Whitefield, N. H.	September 26
Boston, Mass. .	October 15
Worcester, Mass.	October 16
Springfield, Mass.	October 17
Newport Junction, Me.	November 11
Augusta, Me.	November 12
Auburn, Me.	November 13
Bellows Falls, Vt.	December 11
Rutland, Vt. .	December 12
Burlington, Vt.	December 29
St. Johnsbury, Vt.	December 30

Towns represented.

About 2,500 farmers attended these hearings, representing between 70% and 80% of the milk-producing towns in New England.

Information sought.

The farmers were examined on the following general points:

What it costs per year to keep a cow.
The average production per cow per year.
Value of the calf.
Value of manure.
Other problems incident to the production of milk.
Their views as to what ought to be done.

COST OF PRODUCTION

The questioning in each instance developed the fact that the items entering into the cost of keeping a cow could be divided into three main heads,— feed, labor and overhead charges.

1. *Feed,— hay, ensilage, grain and pasture.
2. †Labor.
3. Overhead charges.
   a. Interest on money invested in cow.
   b. Insurance on cow.
   c. Taxes on cow.
   d. ‡Depreciation of cow.
   e. ‖Barn rent.
   f. Bedding.
   g. Keep of bull.
   h. Incidentals,— light, medicine, veterinarian, tools, heating water in winter, salt, etc.

Necessary items.

The above are the items which necessarily enter into the cost of keeping a cow. From the total of these items the value of calf and manure is deducted to get the actual cost of keeping a cow for milk production.

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*Feed. Hay, clover, alfalfa, were figured at the market prices that could be received for the same in the barn on the farm; grain for what it costs plus delivery to the farm; pasture according to its value, taken in comparison with hay and grain; ensilage at its estimated value, $3 to $4 per ton.

†Labor. Labor was charged at the local market price for just the time it takes to care for the cows.

‡Depreciation. Depreciation was reckoned in two ways: (1) depreciation over a period of 3, 5 or 8 years, as to deaths, injuries, loss of udder quarters; (2) depreciation as to the highest selling value of the cow as compared to its final value for beef.

‖Barn rent. Barn rent was charged on a basis of what it would cost to erect a stable to keep the number of cows the producer maintains.

Keeping of accurate records increasing.

The number of producers who kept a strictly accurate record of all the above items was naturally small. During the last five or ten years, however, more attention has been given to the question of the cost of keeping a cow, and the number of producers who have kept accurate records has been rapidly on the increase. As a matter of fact, it was shown that it has been only within the last seven to ten years that serious consideration has been given to an analysis of the items of cost in the keeping of a cow.

Thirty-four cow test associations in Vermont.

More accurate figures were furnished by the producers of Vermont than by the producers of any other part of New England. It was shown that Vermont was the largest dairy state in New England and supports 34 cow test associations.

Opinions vary.

The testimony given by the farmers in the various sections of New England naturally showed a wide range of opinion as to the value of calf and manure, and as to the amounts and prices charged for the individual items. The peculiar conditions in each locality proved to be a large determining factor.

Taken over New England generally, under varying conditions and with varying degrees of efficiency (varying ability) and varying accuracy as to items of cost, the following range of figures represents fairly the evidence obtained at the hearings. It is clear from the inconsistencies in these figures that they furnish no real basis for determining the actual cost of production.

Total Cost	Producer No. 1	Producer No. 2	Producer No. 3
1. Feed, — hay, grain, ensilage, pasture,	$49.40	$51.54	$68.00
2. Labor,	17.72	18.15	45.00
3. Overhead charges,			
a. Interest on money invested in cow,	3.00	5.85	10.00
b. Insurance on cow,	.45	.37	3.00
c. Taxes on cow,	2.15	.75	
d. Depreciation of cow,	5.00	9.75	20.00
e. Barn rent,	2.86	2.00	1.00
f. Bedding,	2.00	1.00	5.00
g. Keep of bull,	2.86	3.00	5.00
h. Incidentals, — light, medicine, veterinarian, heating water in winter, salt, etc.,	1.50	.50	5.00
	$86.94	$92.91	$162.00
Credits			
Value of calf,	$1.00	$11.00	$5.00
Value of manure,	5.00	10.00	15.00
	$6.00	$21.00	$20.00
Net cost to keep a cow,	$80.94	$71.91	$142.00

(These figures show that it costs No. 3 almost twice No. 2 to keep a cow.)

Variation in production. Figures obtained on production varied from 3,500 to 15,000 lbs. per year.

In the above three instances, the amount of production per cow was as follows:

No. 1	No. 2	No. 3
5,293 lbs.	6,590 lbs.	8,000 lbs.

The cost of 100 lbs. of milk to each was, therefore,—

$1.5291	$1.0911	$1.775

Cost per quart, —

$0.0332	$0.0237	$0.0385

The two fundamental factors entering into the cost of a quart of milk are the net cost of keeping a cow per year and the amount of milk the cow produces in a year.

VARIATION IN THE FACTORS GOVERNING THE COST OF PRODUCTION

The several factors entering into the foregoing result varied widely in the different sections of the producing territory according to the grade of stock kept, the methods of feeding, and the character of the soil.

Variation in kind and value of hay fed. 1. The evidence showed that farmers in Massachusetts, Connecticut and Rhode Island valued hay at $15–$20 per ton in barn, while in Maine, New Hampshire, Vermont and Quebec at $8–$12 per ton for the same grade, as it costs around $7 per ton to bale and transport it to Boston. The general farmer raises 50 to 200 tons of hay, but the majority could market only a small percentage of this as No. 1 hay; if it were all baled and sold it would hardly grade as No. 2 hay. Nearly all farmers are feeding timothy and natural grass; only a very small per cent are feeding clover.

Silos. Pasture values. Probably less than 20% of the farmers have silos. Estimates on pasture varied, but the pastures vary to a considerable extent, depending on whether they are good for one, two, three or four months. This will vary in the farms in each locality according to the condition of the pastureland.

Labor in care of cow. 2. Labor was subject to wide variation, — $15 to $45 per year, per cow. In many sections, farmers stated that they could not market their labor in winter in any other way except in the care of cows. Estimates of cost of boarding a hired man were from $7.50 to $22.50 a month.

Bedding and its effect. 3. Many farmers bed with left-over hay and straw and do not charge anything for it. There was some difference of opinion as to whether or not sawdust and shavings were detrimental to the soil.

Depreciation in value. 4. In Massachusetts, Connecticut and Rhode Island, most of the farmers buy cows at $70 to $110, milk them one to four years, then sell them for beef at $20 to $60, according to the size, condition of cow and market price for beef. This depreciation of $20 to $60 is divided over the number of years the cow is kept.

Appreciation in value. In Maine, New Hampshire, Vermont, Eastern New York and Quebec, the majority of farmers are raising calves and young cattle, so as to sell their cows when they will bring the best price, letting the depreciation come on the subsequent owner. Many farmers claimed that they had no depreciation, but all appreciation.

Depreciation on account of death, etc. Very few took into account the depreciation to be figured over a series of years (5, 8 or 10 years) because of sickness, death, loss of calves, bunches on knees, sore teats, and loss of one or more quarters of the bag, etc.

Value of calf. 5. The value placed on a calf ranged all the way from $1 to $10. Value of a calf up to a week old only should be credited to the cow; if a pure bred animal and of good producing family, it should greatly raise the value of the calf.

Value of manure. 6. One of the widest variations was found in the estimated value of manure (from $30 per cow in greenhouses and market-garden districts of Massachusetts, Connecticut and Rhode Island, to $5 in other localities). There seems to be very little definite or accurate knowledge as to what manure is really worth to the land for the raising of crops, or the effect of certain kinds of bedding on the quality of the manure and on the land. Most of the estimates were guesses of $10 to $15, which the farmer had heard had been given out by experiment stations.

Old theory. If many farmers are depending on the value of the calf and manure for their return for the labor in keeping a cow, as many stated was their usual method of figuring (calf and manure offset the labor charge), then many farmers on their estimates were proved to be getting a poor return for their labor.

LACK OF ACCURATE KNOWLEDGE OF COST OF PRODUCTION AMONG FARMERS

It appeared that the situation was further complicated by the fact that producers generally had no accurate knowledge of a number of important factors affecting the cost of production on their farms.

Wide range in production. 1. This was particularly true in regard to the number of pounds of milk per cow. While figures obtained by the committee ranged from 3,500 lbs. to 15,000 lbs. per year, it was clear that there are many cows in New England producing under 3,500 lbs. per year.

It is exceedingly doubtful if most of the cows in New England are producing much more than 3,500 to 4,000 lbs. per year.

Small percentage of pure breds. The evidence demonstrated that while in many towns there are from 5 to 25 producers who have pure bred bulls and some have pure bred cows, as a matter of fact the majority do not have either; and outside of the cow test asso-

ciations a disappointingly small per cent weigh or measure, although there has been a great increase in weighing in the last three or four years.

High percentage without records. Probably 80% of the farmers have no accurate idea of what their cows are producing each year in pounds of milk, to say nothing of their test in butter fat.

Barn rent. 2. Many barns are used not only in stabling cows, but for horses, hens, tools, hay and grain. Cows should be charged only what it would cost to build a stable to handle the number of cows kept by the farmer. Very few charged the cows with only a proportionate part. The feed is charged at the price that could be obtained in the barn.

What comprises incidentals. 3. Comparatively very few farmers had taken any account of incidentals, such as light, medicine, heating water in winter, veterinarian, salt, curry combs, shovels, etc. All of these items are necessary and cost money and should be reckoned in the cost of keeping a cow. All of the figures can be obtained by accounting for the total amount of each one of the items for the entire herd, then dividing by the number of cows, to obtain the individual cost. The total production of each cow, however, should be kept separate, as should also her butter-fat test.

OTHER FACTORS AFFECTING PRODUCTION

The lack of any standardized methods of production and of accurate knowledge of costs is due partly to temporary, partly to permanent, causes. The evidence indicated the following as the principal factors in producing and continuing this condition:

Commercial dairying a new industry. 1. The selling of milk and cream and the commercial creamery and cheese factory are not old, established industries. Fifty years ago saw the first commercial cheese factory, and thirty-six years ago the first commercial creamery. General shipping, to any great extent, of milk and cream by cars began less than forty years ago. Formerly, farmers sold from their farms, for their cash income, corn, oats, wheat, hay, beef, sheep, wool, eggs and poultry, homemade cheese and butter, wood and logs.

2. One great factor in the situation is the varying amount that the milk check contributes to the total amount of money received from all products within the year. Producers are of two main classes.

Milk production the main business. a. Producers whose milk and cream check is 90% of their total income.

Milk production as a side issue.

b. Producers whose milk and cream check is 10% to 60% of their total income; who are selling market-garden produce, eggs, poultry, hay, onions, tobacco, apples, potatoes, pigs, hogs, young stock, cows, wood and logs.

The (a) producer is generally more concerned about his dairy business than (b) producer, who is making milk a side issue and does not pay much attention to breeding, feeding, amount of production as compared with (a) producer, but (b) producers are a big factor and produce in the aggregate much milk and cream for the market.

Advent of foreigners.

3. Many foreigners are taking up farms and producing milk, working the entire family on the farm. Few of these figure labor costs, but their milk and cream come into direct competition with the producer who figures each item.

DISSATISFACTION AMONG PRODUCERS

Producer's solution.

Although the cost of production varies greatly and is not accurately known, producers are practically unanimous that they are not receiving enough for their milk. The producer's solution is more money for his milk, ranging from 4 cents to 6 cents a quart at his door.

Test and price suspected.

It also developed that the producers suspected certain dealers of not giving them an honest test for butter fat. In some localities it was claimed that dealers paid producers a higher price for their milk or gave them a bonus for hauling milk, so as to keep peace in the locality, and prevent producers from getting together.

Deduction for sour or frozen milk.

The dealers in some instances charged the producers for shortage, sour milk and frozen cream, for which the producer claimed he was not to blame, having delivered his product to the dealer in good condition and full measure.

Monopolistic methods.

It was also brought out that, in certain instances, dealers entered creamery districts offering the producers higher prices until such time as the dealer could secure control of the local creamery, when the prices paid producers would be reduced to make up for the higher prices previously paid.

II. COLLECTING, TRANSPORTING, PROCESSING, AND DISTRIBUTING

Analysis of Facts Brought Out in Conference with New England Dealers. Comparison with Methods in Use Elsewhere

The committee held meetings and had conferences with all the large dealers in the Metropolitan District of Boston, Connecticut and Rhode Island and with nearly all the small dealers in the Metropolitan District of Boston. Professor R. Hay Ferguson, working under the auspices of the Office of Markets and Rural Organization of the United States Department of Agriculture and the Massachusetts Agricultural College, has made a very thorough detailed investigation of the cost of the distribution of milk and cream in other cities and towns in Massachusetts. (It is expected that a report of his work will be issued later.) Mr. G. C. White, transportation specialist of the Office of Markets and Rural Organization, in coöperation with the secretary of the committee, spent two weeks in New England investigating at first hand, methods and costs of transportation.

GENERAL OUTLINE

To whom dealers distribute.

Milk and cream is collected, transported, processed and distributed by the dealers to — family trade in bottles, retail stores in bottles, and to wholesale trade in cans.

The distribution of milk and cream is made to the distant consumer by the following operations:

1. Collection from the Producer.

Fewer farmers bringing product to car or plant.

Milk and cream are collected by team, or by motor truck, hired by the producer or dealer, or by the producer bringing his milk and cream to the country plant, creamery or car. Fewer producers are now bringing their own product to the car. The system of having teams or trucks collect the milk and cream is growing rapidly in most of the producing sections. In Connecticut, Rhode Island, Massachusetts and the southern part of Vermont and New Hampshire, the greater part of the milk is loaded on the cars directly from the wagons of the producers or collectors.

2. Country Milk and Cream Plant.

Location of country plants.

There are no country plant or railroad charges when farmers or collectors bring their product directly to the dealer or car.

In Maine, the northern part of New Hampshire, Vermont, New York and Quebec, the greater part of the product is brought to a country plant where the following operations may take place:

Various operations in country plants.

a. The milk is cooled, recanned and loaded into cars.

b. The milk is separated, the cream is pasteurized, cooled, canned and loaded into cars. The skim milk is cooled, canned and loaded, or it may be condensed and loaded into large cans or barrels.

c. Milk and cream are received, run through separators, and then standardized by being brought together in such proportions as to make a certain grade of milk with a known specified butter fat, as 3%, 3½% or 4%.

d. Milk is pasteurized, cooled, canned or bottled and loaded into cars.

e. Cream is received, pasteurized, cooled, canned and loaded into cars, or made into butter, as business may demand.

3. Transported on Cars.

Railroad transportation.

Railroads handle both milk and cream under different methods; some at the same rates for both and others at different rates. (This is explained in detail under the heading of Railroad Transportation.)

4. City Milk and Cream Plant.

City milk plant. Various operations of processing. Some of the city plants are on side tracks, the cars unloading directly on the platforms; others are not so situated and the cans are trucked to the plants. The various operations through which milk and cream pass in being processed before distribution to the consumer are as follows:

a. Milk and cream that have been pasteurized in the country is either bottled or recanned or put in storage.

b. Milk that has not been pasteurized generally undergoes the following "processing":

Unloaded and mixed. **1.** Unloaded, strained and pumped into large tanks where it is mixed.

Put through a clarifier. **2.** Put through a clarifier (a centrifugal machine, somewhat like a separator, which removes the dirt and sediment).

Pasteurized. **3.** Pasteurized (heating the milk to 145 degrees, holding it at this temperature for thirty minutes). By this means the bacterial germs of typhoid, diphtheria, scarlet fever, septic sore throat and tuberculosis are killed and the high bacteria count is reduced.

Cooled. **4.** Cooled to between 45 and 50 degrees.

Bottled, canned and stored. **5.** (a) Put in bottles and then in cases, which are put in refrigerators and there held until they are delivered to the family trade or the retail stores; or (b) put into cans and then into refrigerators until delivery is made to the wholesale trade.

Most of the cream is pasteurized in the country. If not, this is done on arrival at the city plant. It is then bottled, canned, cooled and stored in the same way as milk.

Size of containers. Milk is put in quart and pint bottles to deliver to family trade and retail stores, and in $8\frac{1}{2}$- and 20-, $21\frac{1}{2}$- and 40-quart cans to deliver to the wholesale trade.

Cream is put in quart, pint and half-pint bottles for family and retail store trade and in $8\frac{1}{2}$-, 20-, $21\frac{1}{2}$- and 40-quart cans for wholesale trade.

Butter fat varies.

In natural cow's milk the butter fat varies. (See page 3.) (The legal standards of butter fat vary in each state according to the state law. See table, page 41, for varying standards.)

In cream, the butter fat varies from 15% to 44%. Some companies make the following grades: 15%, 17%, 20%, 22%, 24%, 26%, 30%, 34%, 38%, 40% and 44%. (This is done by standardizing, — combining butter fat and skim milk.)

CLASSIFICATION OF DEALERS

The dealers (distributors) fall, broadly, into five classes:

1. Large dealers, handling daily five cars, or over, of milk and cream, whose supply comes from several states and the Province of Quebec. (Four in greater Boston.)

2. Dealers handling one to five cars daily, whose supply comes from one or two states and locally. (Twelve in greater Boston.)

3. Cream dealers, that is, those whose business is largely handling cream, whose supply is from two or three states or Quebec. (Six in greater Boston.)

4. Small dealers, operating from one to ten retail wagons, whose supply of both milk and cream comes from large dealers or from local producers. (Five hundred and over in greater Boston.)

5. Producers who are putting out a special or certified milk. (This class is very small, handling less than 1% of the trade. On account of its special character, it has not been treated in this report.)

SYSTEMS OF BUYING MILK AND CREAM FROM THE COUNTRY PRODUCER

A great variety of methods is practiced in New England in determining the price and terms at which the dealer buys from the country producer. The following may be described:

1. Methods of Buying Milk.

Various systems.

a. On the 8½-, 20-, 20½-, 21½-, 40-, 46-qt. can or jug, or 100 lb. basis, regardless of butter fat or barn score. (Example, 26 cents to 40 cents per 8½-qt. jug; $1.50 a 40-qt. jug, or $1.25, $1.50 or $1.80 per 100 lbs.)

b. 100-lb. basis with a minimum standard for butter fat plus a bonus for extra points butter fat. ($1.25 per 100 lbs. for a minimum standard of 3.6% or 3.8% butter fat, giving 5 cents or 10 cents per hundred for each additional tenth of a point butter fat; for instance, on a 3.8% basis and a 10-cent point premium, a 4% milk would bring $1.45, if $1.25 was the base price of 3.8%.)

c. Same basis as (b) with the addition of minimum standard for barn score and premium for extra points barn score. (Suppose company was giving a premium of 10% for a barn score of 68 or over, this would be added to the base price.)

d. Butter fat basis plus amount for hundred weight of skim milk. (Example, if the price was 38¢ lb. for butter fat and 70¢ for hundred weight for skim milk, a 4% milk would be computed as follows: 4 x 38 = $1.52 for butter fat (100 lbs. − 4 lbs. fat = 96 lbs. skim milk; 96 lbs. x 70¢ = 67¢ for skim milk. $1.52 + .67 = $2.19 per 100 lbs., or 4-7/10 per qt. The process would be the same for any milk, just changing the per cent of butter fat in computation.)

e. Butter fat basis plus amount for hundred weight of both butter fat, milk and skim. (Same process as (d) except you use total weight, on a basis of 38¢ lb. butter fat and 70¢ per hundred weight, multiply 4% by 38 and then add 70¢.)

2. Methods of Buying Cream.

a. Butter fat basis entirely. (So much per lb. butter fat, — Babcock test.)

b. Butter fat basis plus hundred weight of butter fat, and skim milk. (So much per lb. butter fat, plus 30¢, 40¢, 50¢, 60¢ per hundred weight of butter fat and skim milk.)

3. Types of Agreement between Dealer and Producer.

Variation in buying contracts.

a. Six months contract with prices quoted.

b. Six months or years contract with prices quoted, producer agreeing to deliver not over 10% above or below the amount stipulated by him.

c. Making price month by month, quoting perhaps one or two weeks in advance; no special contract with producer.

d. No contract with producer; he sends milk, dealer sends check, paying what he chooses.

e. No special contract with producer, but agreeing to pay for butter fat, based on Boston Chamber of Commerce quotations for butter. Averaging the four weekly quotations for a month's price to producer.

f. Same as (e) but agreeing to pay a premium over Chamber's quotations.

4. Time of Payment to Producer.

No uniform system of payments.

a. Every week.
b. Every two weeks.
c. Once a month for the previous month.
d. On the 5th day for the preceding month.
On the 13th day for the preceding month.
On the 15th day for the preceding month.
On the 18th day for the preceding month.
On the 20th day for the preceding month.
On the 25th day for the preceding month.
On the 25th to 30th day for the preceding month.
On the 30th day for the preceding month.
e. Two or three months in arrears.

5. Price Producers Receive.

Range of prices paid producers during the year.

The price the producer receives varies according to the locality and according to the system by which the milk and cream is bought. It is utterly impossible to give an adequate estimate as to what the general price is. (Each producer should know in his own locality.)

Prices in localities near large towns and cities range from 4 cents to 6 cents per quart at the farmer's door — generally no stipulation as to butter fat. In some of these localities, a lower price is paid in summer, unless the farmer agrees to produce an even quantity.

In the localities where car shipments are made, or milk and cream are collected or brought by the farmer to the country plants, the prices vary from $1.10 a hundred weight in May and June, to $2.20 in December; and prices for butter fat will vary from 25¢ to 39¢ per lb., and prices per hundred weight of skim milk from 30¢ to 70¢; and the price per $8\frac{1}{2}$-qt. can will vary from 25¢ to 45¢.

Bonding law.

Maine, New Hampshire and Vermont have laws requiring the dealer to furnish a bond securing payment for the milk and cream bought in the state.

There are about 75 cars of milk and cream moving in New England daily, of which about 60 come to the Metropolitan District of Boston.

Methods of handling milk and cream.

Milk and cream are handled in the following ways by the railroads operating in New England, Eastern New York and the Province of Quebec — as express, excess baggage, in cars leased to dealers (dealer leasing car per trip or per annum, doing his own loading, unloading and icing), and in carloads in passenger milk-train service (the loading, unloading and icing being done by the railroad within the state of Massachusetts under the Saunders Law; also outside of Massachusetts in Boston & Maine Railroad territory on a guaranty of 5,100 quarts).

Free transportation for caretakers.

In all cases of leased cars, both ice and caretaker are provided by the dealer, although the railroad company furnishes free transportation for one or more caretakers.

Milk and cream are handled over the railroads operating in New England and the Province of Quebec as follows:

New York, New Haven & Hartford Railroad

Various methods of the different railroads.

1. As express by the express companies.
2. As excess baggage by the railroad company.
3. In cars leased from the railroad, the dealer doing his own loading, unloading and icing, always paying minimum carload rate, and for an excess over 8,925 quarts.

Boston & Albany Railroad

1. As express by the express companies.
2. As excess baggage by the railroad company.
3. In milk cars, operated under the Saunders Law (per can rate, railroad loading, unloading, and icing the milk.)

Boston & Maine Railroad

1. As express by the express companies.
2. As excess baggage by the railroad company.

3. In milk cars, operated under the Saunders Law (per can rate, railroad loading, unloading and icing the milk).

4. In cars leased from the railroad, dealer loading, unloading and icing his own milk, always paying minimum carload rate, and excess over 8,925 quarts.

5. In cars operated by the railroad, on a guaranty of 5,100 quarts, the railroad company loading, unloading and icing the milk when there is a guaranty of 600 8½-qt. cans or 5,100 quarts in 40 miles of straightway track.

Rutland Railroad

1. As express by the express companies.

2. As excess baggage by the railroad company.

3. In cars leased from the railroad, dealer loading, unloading and icing his own milk, always paying minimum carload rate, and excess over 25,000 lbs. (9,088 qts. in 40-qt. cans).

Maine Central Railroad

1. As express by the express companies.

2. In cars leased from the railroad, dealer loading, unloading and icing his own milk, always paying minimum carload rate, and excess over 8,925 quarts.

Central Vermont Railroad

1. As express by the express companies.

2. As excess baggage by the railroad company.

3. In cars leased from the railroad, dealer loading, unloading and icing his own milk, always paying minimum carload rate, and excess over 12,000 quarts.

Canadian Pacific Railroad

1. All cream is handled as express by the express companies.

2. All milk is handled as baggage by the general baggage departments.

RATES FOR RAILROAD TRANSPORTATION

Express rates. The express service is governed by the regular tariffs of the express companies. Icing is not included under these tariffs.

Excess baggage rates. The excess baggage rates are contained in the published tariffs of the railroads, which authorize the carrying of milk on regular passenger trains, icing not included, with the exception of the Maine Central, which carries no milk as excess baggage.

Minimum carloads, Boston & Maine freight service 25% less than passenger.

On freight or passenger train service, in carload lots, the dealer leases the car (doing his own loading, unloading and icing) under a regular published rate, at so much per year, according to distances, paying always for a minimum carload of 8,925 quarts (except on the Rutland Railroad, where the minimum is 25,000 lbs., and on the Central Vermont, where the minimum is 12,000 quarts). An extra charge is made per quart for each quart carried in excess of the minimum carload required.

The freight and passenger train rates are the same except on the Boston & Maine, where the freight charge is 25% less than the passenger charge.

The cream rate on the New York, New Haven & Hartford is 50% more than milk rate.

Saunders Law in Massachusetts.

In the state of Massachusetts, by virtue of the Saunders Law, the railroads are compelled to load, unload and ice the milk. This milk is carried on a per can rate, the rate increasing with each more distant zone.

Bulk of product handled by Boston & Maine.

The bulk of the milk and cream is handled under the leased car system by the Boston & Maine Railroad, either from its own territory or from the Maine Central, Canadian Pacific, Central Vermont, Rutland, or Delaware & Hudson Railroad.

Boston & Maine System of Rates for Leased Cars in Passenger Service

Boston & Maine leased car rates.	1st zone, 1–75 miles,	$125 per mile per year.
	2d zone, 76–125 miles,	$112.50 per mile per year additional to the $125.
	3d zone, 126 miles and over,	$75 per mile per year in addition to the $125 and $112.50.

Maximum charge, $18,000; minimum charge, $5,000, per year per car.

When cars are operated in freight train service, the charge is 75% of the above rates. (For baggage rates see pages 27 and 28.)

Maximum charges. This maximum charge under the above rates is reached at 166 miles, so that milk or cream is carried by the Boston & Maine for greater distances — 300 miles and more, in some instances — at the same price as for 166 miles. Cream is carried at the same rate as milk.

Small branch lines make leased car system a natural monopoly. Because of the many little branch lines of railroads in New England, on which only one car of milk is produced, the leased car system has built up a natural monopoly. Each dealer has largely his own territory, and the result is that in 75% of the New England territory the producer has no one to whom to sell except the dealer operating the car in his locality. Consequently it is practically impossible for the producers to secure competitive bids for their products.

N. Y., N. H. & H. R. R. system of rates. In Connecticut, Rhode Island and Massachusetts, under the excess baggage rate (no icing) of the New York, New Haven & Hartford Railroad, the rates are as follows:

1–20 miles in 8½-qt. can — milk .6 of a cent per qt., cream .9 of a cent per qt.
20–50 miles in 8½-qt. can — milk .7 of a cent per qt., cream 1 cent per qt.
50–99 miles in 8½-qt. can — milk .8 of a cent per qt., cream 1.2 of a cent per qt.
100 miles in 8½-qt. can — milk .9 of a cent per qt., cream 1.4 of a cent per qt.
(If shipped in 10-, 21- or 40-quart containers or in 20-, 30-, 40-, 50 — 100 can lots, the rates are a little less per quart.)

In Connecticut the leased car rates are a flat rate of $125 per mile for carloads of 8,925 quarts. (For illustration, the leased car rate from Jewett City, Conn., to Boston is .00338 per quart, and from Willimantic to Boston, .00342 per quart.)

Boston & Albany Saunders Law rates. In Massachusetts, under the Saunders Law, the railroad loads, unloads and ices the milk. The rates on the Boston & Albany are approximately .6 of a cent per quart for an 8½-quart can from

Barre, East Brookfield, Palmer, or South Framingham to East Cambridge, Massachusetts. A small reduction from this rate is made for shipping 21½- and 40-quart cans.

Typical rates. Appended hereto is a table showing the cost per can and per quart for shipping milk and cream between various points in New England. (The rate applies to both unless otherwise noted.)

TABLE

*** Massachusetts**

	Miles	In baggage cars Per 8½-qt. can	Per qt.
No. Wilmington to Oak Grove	12	2¢	.00235
Princeton to Worcester	16	2¢	.00235
Barre to Worcester	31	3¢	.00352
West Acton to Peabody	46	4¢	.0047
Pepperell to Boston	50	4¢	.0047
Charlemont to Boston	128	6¢	.007

New Hampshire

	Miles	In baggage cars Per 8½-qt. can	Per qt.	Leased cars Per qt.
No. Hampton to Lynn	38	3¢	.00352	.00153
Dover to Boston	68	5¢	.0058	.00026
Plymouth to Boston	125	6¢	.007	.0046
Lancaster to Boston	210	6¢	.007	.00469

Maine

	Miles	In baggage cars Per 8½-qt. can	Per qt.	Leased cars Per qt.
No. Berwick to Boston	78	5¢	.0058	.00297
Gorham to Boston	120	6¢	.007	.00441
Farmington to Boston	198	No baggage rate		.00414
Belfast to Boston	246	No baggage rate		.00414
Dover and Foxcroft to Boston	256	No baggage rate		.00414

Quebec

	Miles	In baggage cars Per 8½-qt. can	Per qt.	Leased cars Per qt.
Lenoxville, Que., to Boston	278	6¢	.007	.00552
†W. Shefford, Que., to Boston	302	28¢ B.&M. 41¢ Dominion Express 69¢ Cream in 40-qt. cans	.01725	

* There are no leased cars in Massachusetts. Larger sized receptacles are proportionate or slightly lower. Where there is sufficient milk to warrant operating car between points, in Massachusetts the rate is ½c above the baggage rate per 8½-qt. can covering the care and ice. Outside of Massachusetts, larger-sized receptacles are proportionate or slightly lower.

† No leased car rates from West Shefford. (Cream only is shipped from Canada.)

TABLE (continued)

Vermont

	Miles	In baggage cars Per 8½-qt. can	Per qt.	Leased cars Per qt.
Swanton to Boston	300	6¢	.007	.00552
Newport to Boston	232	6¢	.007	.00552
Bellows Falls to Boston	114	6¢	.007	.00422

Brandon, Vt., to Boston

	Miles	In baggage cars Milk per 40-qt. can	Cream per 40-qt. can		Leased cars Per qt.
B. & M. R. R.	114	28¢	28¢	$37.71 per car 8,925 qts.	.00422
Rutland R. R.	61	20¢	30¢	21.00 per car 25,000 lbs.*	.00288
	175	[1]48¢	[2]58¢	$58.71	.00710

[1].012 per qt. [2].0145 per qt.

No. Bennington, Vt., to Boston (via Bellows Falls)

	Miles	Milk per 40-qt. can.	Cream per 40-qt. can.		Per qt.
B. & M. R. R.	114	28¢	28¢	$37.71 per car 8,925 qts.	.00422
Rutland R. R.	106	25¢	35¢	26.25 per car 25,000 lbs.*	.00288
	220	[3]53¢	[4]63¢	$63.96	.0071

[3].01325 per qt. [4].0157 per qt.

Randolph, Vt., to Boston

	Miles	Milk per 40-qt. can	Cream per 40-qt. can		Per qt.
B. & M. R. R.	143	28¢	28¢	$45.21 per car 8,925 qts.	.00506
Central Vermont	33	20¢	30¢	15.00 per car 12,000 qts.†	.00125
	176	[5]48¢	[6]58¢	$60.21	.00631

[5].012 per qt. [6].0145 per qt.

* Rutland carload specified "milk in cans." (25,000 lbs. — 227 40-qt. cans or 9088 qts.)
† Central Vermont carload specified "milk or cream."

DISTRIBUTION OF MILK AND CREAM

The distribution of milk and cream may be divided into three classes:

In bottles to family and retail stores.

1. To family trade in bottles.
2. To the retail stores, generally in cases of twelve-quart bottles or twenty-pint bottles each. Many of the distributors furnish refrigerators and also ice to the retail stores.

In cans to wholesale trade.

3. To the wholesale consumers in cans. This includes hotels, restaurants, boarding-houses, institutions, delicatessen shops, drug stores, bakeries, ice-cream manufacturers, candy manufacturers, etc.

Estimated percentages in Greater Boston.

As near as it can be estimated, taking the total amount of milk and cream delivered in Greater Boston as 100%, it is divided up approximately as follows:

	Milk	Cream
To family trade, in bottles	20 to 25%	5 to 15%
To retail stores, in bottles	20 to 25%	10 to 20%
To wholesale consumers, in cans	50 to 60%	50 to 75%

In smaller cities.

In cities of 100,000 population, or less, the retail store trade and the wholesale trade diminishes (there being fewer hotels, restaurants, boarding-houses, candy manufactories, etc.), and per cent to family trade increases. In cities of 5,000 to 25,000 the proportion to family trade is 80% of the total.

VARIATION OF COST OF EACH OPERATION PER QUART

	Cost	(Varying Figures of Different Companies)		
Collection.	Lowest	$0.0025	$0.0001	$0.002
	Highest	.015	.0191	.011
	Usual	.00625	.0066	.003
Country plant.	Lowest		.0025	.0034
	Highest		.01125	.0048
	Usual	.0075*	.004	.004

* Includes pasteurization.

VARIATION OF COST OF EACH OPERATION PER QUART

(Continued)

	Cost	(Varying Figures of Different Companies)			
Railroad transportation.	Lowest		$0.0044	$0.0039	
	Highest		.0103	.0091	
	Usual	$0.005		.00438	
City plant.	Lowest		.0040		
	Highest		.0085		
	Usual	.005*	.0070	.0135	$0.0068
Distribution family trade.	Lowest		.0225		
	Highest		.0500		
	Usual		.0300	.0386	.0235
Retail stores.	Lowest		.0100	.0188	
	Highest		.350	.0219	
	Usual	.01	.015 to .02	.0205	.0095
Wholesale trade.	Lowest		.004	.0103	
	Highest		.00529	.0128	
	Usual	.005	.0047	.0113	

From the above table of costs it appears that there is a considerable variation between the highest and lowest cost of each individual item. This has a marked effect on the "usual cost," since it frequently places this "usual cost" at a widely different figure from that representing the cost of processing the greater part of the milk coming into Metropolitan Boston.

Taking Up Each Point:

Collection. The cost of collection from the producer and delivery to the country plant or car varies from ¼¢ to 1½¢ per quart, depending on the length of the route, the character of the roads, whether hilly or level, the regularity of amounts collected per day throughout the entire year, and the total amount per day the entire route will average. Local conditions govern this entirely.

Country plant. Expenses vary here from ¼¢ to 1¼¢, depending almost entirely on the number of quarts put through the plant, and the number of operations necessary before loading on

* Does not include pasteurization.

the car, and the great variation in the monthly receipts of milk and cream (since the overhead expenses remain practically the same throughout the twelve months, and in many sections there is an extreme variation in the monthly receipts; receive more in April, May, June and July than in the other eight months).

Transportation on railroads. This varies from $\frac{1}{4}$¢ to $1\frac{1}{4}$¢ in leased cars, according to the distance, the number of railroads the car uses, the number of days the cars fail to carry the minimum number of quarts which must be paid for per carload, the number of days the milk and cream has to be iced, and the number of stops necessary to complete a carload (this requiring the services of one or more caretakers).

Rates on milk and cream shipped by express and as "excess baggage" are not given in the table or compared, as this will be found under the head of Railroad Transportation.

City plant. The cost varies from $\frac{1}{2}$¢ to $1\frac{1}{2}$¢, depending on the overhead charges of the plant, the arrangement and machinery in operation, the regular amount of the milk put through and the cost of labor and ice.

Distribution.

Family trade. The cost here varies from $2\frac{1}{4}$¢ to 5¢ in bottles, depending on the loss in bad bills (average monthly bill of 30 quarts, $2.70; many move or avoid payment, bill too small to pay for costs of collection, but the aggregate is a substantial amount), non-return of bottles, the density of the population, the number of stops required to deliver a load (depending on whether the customer takes a pint, quart or two or three quarts), and the average number of quarts that are carried through the year (which varies from 200 to 400 quarts per team). On many routes people are away during the summer, leaving a team for months with only half of its regular load.

Retail stores. (Bottles in cases.) The cost of delivery to the retail stores varies from 1¢ to $2\frac{1}{2}$¢, depending on the distance traveled, the number of stops necessary to deliver a load (10 to 35), and whether or not two trips can be made in a day.

Wholesale trade. The cost to the wholesale consumer varies from $\frac{1}{4}$¢ to 1¢, depending on the number of stops, the distance, the number of trips a two-horse team or motor truck can make in a day, and the size of the container, whether 8-, $8\frac{1}{2}$-, 20- or 40-quart or $21\frac{1}{2}$-quart container (a 20-, $21\frac{1}{2}$- or 40-quart container costing $\frac{1}{4}$¢ to $\frac{1}{2}$¢ per quart less to handle).

DIFFICULTY OF REDUCING COST OF FAMILY DISTRIBUTION

Delivery to family trade expensive.

It will be readily seen that the total cost of collection in the country, the operation of country plant, railroad transportation and city plant expenses is a little over or under 3¢, and that the cost of distribution to the family trade is 2¢ to 5¢, to the retail stores 1¢ to 2¢, and to the wholesale trade ½¢ to 1¢. The greatest single item of cost is, therefore, delivery to the family trade, equaling the cost of collection, country plant, railroad, transportation and city plant expense.

Dealers claim no saving of money in a central delivery.

The dealers assert that there can be no reduction in delivery expenses, as they are now approximating the highest possible efficiency from their teams and men. The dealers state that despite duplication of delivery on certain streets, a central delivery, though saving time, would mean no saving in expense for the following reasons:

Loss of teams and trucks.

1. Each company would have to maintain motor trucks or two-horse teams to carry its product to central plant delivery, which would be useless the rest of the day.

Difficulty in stacking a load.

2. It would be impossible for one motor truck to so arrange or stack a load as to carry the various brands and different sized bottles of the dealers operating in any given territory, so they would be readily accessible for quick deliveries. (There might be 20 different brands in ten or twelve different sized containers.)

No means to supply extra wants.

3. Customer could not secure extra milk without notice, as driver could not carry extra milk impartially for all dealers.

Bigger loss in bottles.

4. There would be a tremendous loss in bottles, as no one could look after the particular interest of each dealer as the individual dealer's own driver does.

Extra expense to collect bills and solicit trade.

5. Each dealer's driver now acts as solicitor for new trade, collects bills and bottles. It would be necessary to hire a man to do this additionally.

Necessary to advertise.

6. The cost of advertising would be increased by the loss of advertising through the elimination of individual teams.

THE AVERAGE DEALER'S LACK OF KNOWLEDGE OF THE COST OF OPERATING

Large per cent of dealers with no detailed costs.

While the committee has received coöperation from all the dealers, and some very accurate figures from a few, the majority could not furnish much definite data as to individual items of cost of operation. This makes it impossible to estimate accurately the variation in cost items and to determine how they may be reduced.

Many dealers do not keep themselves posted on the new methods of processing, testing, grading, etc., but continue the older methods.

Some antagonism exists between small and large dealers. The committee found some small dealers, however, who felt no antagonism against the big dealers and who were operating fully as efficiently. Here again it was found to be largely a question of bookkeeping and the grasping of up-to-date methods.

PRICES RECEIVED BY DEALERS FOR MILK AND CREAM

Milk.

	Family trade	Retail store trade	Wholesale trade
In quart bottles,	8¢ to 10¢	6¢ to 8¢	
In pint bottles,	4½¢ to 5¢	3¢ to 4¢	
Price per quart in 8½-, 20-, 40-qt., etc., cans,			5 3/10¢ to 7¢

Cream: In Quart Bottles. (Varying percentages and prices of different dealers.)

	To family trade			To retail store trade		
Light,	17%*	30¢—15%	25¢ 25¢	17%	25¢—17%	20¢—15% 22¢
Medium,	26%	40¢—25%	35¢ 40¢	26%	35¢—25%	26¢—25% 32¢
Heavy,	40%	60¢—40%	50¢ 60¢	40%	50¢—40%	39¢—40% 44¢

In Pint Bottles.

	To family trade		To retail store trade		
Light,	15%	14¢—17% 15¢	17%	11¢—15% 12¢	
Medium,	25%	18¢—26% 20¢	25%	14¢—25% 17¢	
Heavy,	40%	27¢—40% 30¢	40%	20¢—40% 23¢	

* Per cent butter fat.

In One-Half Pint Bottles.

	To family trade	To retail store trade
Light,	15% 8¢ — 17% 8¢	15% 6¢ to 7¢ — 6¢
Medium,	25% 11¢ — 26% 10¢	25% 9¢ to 10¢ — 8¢
Heavy,	40% 15¢ — 40% 15¢	40% 11¢ to 12¢ — 11¢

To Wholesale Consumers.

In gallon containers		In 10-gallon containers
Per cent fat	Price per qt.	Price per qt.
44%	42¢	40¢
40%	39¢	$36\frac{3}{4}$¢ to $37\frac{1}{2}$¢
37%	36¢	$34\frac{1}{4}$¢
35%	34¢	$32\frac{1}{2}$¢
33%	33¢	$30\frac{7}{10}$¢
30%	30¢	$28\frac{1}{4}$¢
25%	26¢	24c to $32\frac{1}{2}$¢
20%	22¢	19¢
18%	20¢	$17\frac{3}{4}$¢
17%	20¢	17¢
15%		$16\frac{1}{4}$¢ to 20¢

Prices dealer receives from family and retail store trade.

From the above table it will be seen that the average prices received by the dealer for milk delivered to family trade is 9¢ per quart, and to retail stores, 6¢ to 8¢ per quart.

It is difficult to estimate the average price paid by retail stores, — it would range between $6\frac{1}{2}$¢ and 7¢ in some sections and 7¢ to $7\frac{1}{2}$¢ in others, depending upon competition and the density of population.

Retail store prices.

The prices charged the consumer by the retail stores vary from 7¢ to 9¢. Again it would be difficult to estimate the average price, because it varies according to the policy of the retail stores (whether selling at cost to attract trade, or for convenience of customers, or selling at a profit).

Wholesale trade price.

The wholesale price for milk varies from 5¢ to 7¢; perhaps an average would be roughly 6¢.

Bottle charge.

Some dealers charge the retail stores from 2¢ to 5¢ for bottles; probably not more than 25% or 30% of these stores, however, charge their customers.

Summary of prices dealer receives.

In summarizing, the dealers receive about 9¢ a quart for regular delivery to family trade, 6¢ to 8¢ (with a varying average usually of 6½¢ to 7¢ and 7½¢) for delivery to the retail store trade (sometimes being paid for the bottles, although this is not generally the case), and about 6¢ per quart for delivery to the wholesale trade in cans.

Prices consumer pays.

The consumer who has milk delivered to his door regularly by a dealer pays 8¢ to 10¢, usually about 9¢, according to the locality. Pints are generally sold at 5¢ or billed to consumers at 4½¢ on monthly accounts. The consumer purchasing from retail stores pays 7¢ to 9¢, and in many instances 2¢ to 5¢ for the bottle.

Growth in use of pint bottles.

The dealers assert that the pint-bottle business is growing, not only on account of hard times, but because of its convenience. They maintain that it costs much more to handle two pint bottles than one quart and that they should receive an extra cent for the pint.

Variation in cream prices and percentage of butter fat.

Prices received for cream sold to the family and retail store trade vary as much as does the per cent of butter fat; in wholesale trade, prices and butter fat vary so considerably as to make comparisons impossible. (See price table for variations.)

Skim Milk is brought from the country in cans and sold directly to bakeries, hotels, restaurants and boarding-houses. One large company is bottling and selling it to

retail stores at 3¢ per quart. Retail stores sell to the consumer at 4¢ per quart. Wholesale prices of skim milk vary so much as to make comparisons of no special value.

TIME OF PAYMENT FOR MILK AND CREAM BY THE CONSUMER

The majority of milk and cream sales are made payable at the following times:

When dealer gets his money.

1. Cash on delivery.
2. Cash once a week.
3. Cash once in two weeks.
4. Cash once a month.

Where tickets are used.

Tickets are used, for which the money is received in advance, in Hartford and New Haven, Conn., and in Lewiston, Auburn and Portland, Me.

It is impossible to state the percentage of money collected, but there is a tendency to get the monthly and the bi-weekly accounts on a weekly basis.

III. PROBLEMS IN SALE AND DISTRIBUTION AS BROUGHT OUT IN CONFERENCES WITH THE DEALERS

DECREASE IN CONSUMPTION

Decrease in fluid milk consumption.

General consumption of fluid milk for cooking purposes as well as individual consumption has decreased per capita in the last ten years, partly for the following reasons:

Food value unknown.

1. Lack of knowledge of the food value of milk as compared with other food products.

Much agitation.

2. Agitation has lessened public confidence.

High price.

3. High prices (consumer not realizing the food value).

Hard times.

4. At present, hard times in business have to some extent cut down the quart consumption to pints.

Increased use of condensed milk and milk powder.

5. Some of the wholesale trade are using condensed and evaporated milk and milk powder instead of whole milk or skim milk, on account of price, convenience and even quality of the product as compared with whole milk and skim milk.

6. Ice cream manufacturers use both condensed milk and milk powder to give body to their product.

7. Family trade is using condensed milk in the place of whole milk for the following reasons:

Reasons for increase.

a. It is convenient.
b. It will keep without ice.
c. It is thick, and some prefer it to whole milk, especially for coffee.
d. Prizes are given for saving the wrappers.
e. It is well advertised.

Milk powder in its infancy.

It is difficult to estimate the extent to which the condensed and evaporated milk and milk powder are cutting into the fluid milk trade, as it varies so

considerably with the wholesale users, in different sections. It is clearly a very important factor of competition in the selling of fluid milk and cream, and is increasing. The manufacture of milk powder is apparently in its infancy.

CUT-THROAT COMPETITION AMONG DEALERS

Intense competition for city milk and cream trade.

There is intense competition among all classes of dealers. Many dealers have at various times a surplus product to dispose of, and are often willing to sell to a competitor's trade at a considerable discount under market price. This tends to make chaotic the general wholesale trade. This condition has been made possible by the slight attempt on the part of the producer to bring about an evenness of production.

Other difficulties growing out of this extreme competition are:

Methods used.

1. Wholesale buyers of milk and cream asking and some dealers offering to give a cash or trade bonus for a six months or years business.
2. The loaning of money by distributors to wholesale consumers in return for their exclusive trade.

LACK OF A STANDARDIZED PRODUCT

No special standard.

Milk and cream are sold on the basis of no special standards as to cleanliness or butter fat (with the exception of the fact that state and city standards are supposed to be complied with). Milk may range from the minimum legal standard to 8% fat. The bacteria count varies by hundreds of thousands.

Great variations in grades of cream.

Cream is sold to a great extent by trade names, as "heavy," "medium," "light," "breakfast," "No. 9," "12," "17," etc., instead of by designating the percentage of butter fat, which varies to a considerable degree in the products put out under these various trade names.

Family trade. In some districts 10% to 60% of the family trade leave the city for one to four months each year. Many families go away for Saturday and Sunday, making a two-day surplus for the dealers.

Restaurants. Many restaurants, etc., in business districts do not keep open on Sunday, but the dealers must receive the milk produced on that day and dispose of it.

Wholesale trade. On hot days during June, July and August, the consumption of milk and cream by hotels and restaurants, drug stores and ice-cream dealers will run 20% to 30% above normal. This is a vital factor in supplying and distributing to the wholesale trade.

IV. INSPECTION, GRADING AND STANDARDS

Conference with health officials.

The committee held a conference with representatives of the State Boards of Health of the New England States, the Province of Quebec, and the local boards of the large cities and towns in New England. The committee has also had many personal interviews with state and local health officials and milk inspectors.

It appeared to be the opinion of the majority that dairy inspection should be under the supervision of the State Board of Health, with uniform rules and regulations; and that city inspection should be under the supervision of local boards.

Some favored compulsory pasteurization of all grades of milk; others did not favor it.

It was agreed that the New England States and the Province of Quebec ought to coöperate in establishing uniform standards, rules and regulations in inspection and grading.

Two divisions of inspection.

The inspection of milk and cream falls into two divisions: dairy inspection in the country, and city inspection of milk plants and of the milk and cream on wagons and in the retail stores.

Country inspection.

Some of our large cities of over 100,000 population inspect the dairies in their immediate vicinity; Boston is probably the only city which inspects its out-of-state supply, which aggregates 75% to 80% of the city's milk and cream.

Several inspections for some producers; for others, none at all.

In some places, the farms are visited by inspectors from three or four different cities, the State Board of Health and the Bureau of Animal Industry; while in other sections there is no inspection whatsoever. This is especially true of sections producing cream. Various kinds of score cards are used, and the regulations are far from uniform.

City inspection.

The cities of New England, with the exception of a very few, collect samples from dealers and stores and maintain a laboratory for an analysis of fats, solids and bacteria. The City of Boston has inspectors stationed in all of the large city-distributing plants.

No official grading.

At present there is no official grading of milk in New England, but there is sold commercially in addition to the ordinary market milk a certified and an inspected milk which have not been discussed in this report.

Standards not uniform.

Legal standards for butter fat, solids not fat (see bottle diagram on page 3) and total solids vary in the different New England States from no standard for fats in the state of New Hampshire (no legislation), to a standard of 3.35 in Massachusetts. The fat of cow's milk varies from 2.5 to 8%.

Following is a table giving the variations in legal standards.

	Fat	Solids not fat	Total solids	Standard for cream	Ice cream standard per cent. fat
Maine,	3.25	8.50	11.75	18%	14%
New Hampshire,	none	none	12.	18%	14%
Vermont,	3.25	9.25	12.50	18%	14%
Massachusetts,	3.35	none	12.15	15%	7%
Connecticut,	3.25	8.5	11.75	16%	none
Rhode Island,	2.5	none	12.	none	8% or 6% with fruit
New York,	3.	8.5	11.5	18%	.....

V. PRINCIPAL POINTS BROUGHT OUT BY THE INVESTIGATION

The foregoing review of the present situation points to the following conditions as the essential causes of the difficulty:

LACK OF A STANDARDIZED PRODUCT

The value of a particular quart of milk or cream depends on its cleanliness and the percentage of butter fat and solids not fat which it contains (see diagram on page 3). These percentages vary greatly with different quarts. Butter fat can be readily measured when the farmers offer their product to the dealer, and the farmers or dealers can, by proper mixing or standardizing, control it in the product which they offer to the public. These percentages, together with the cleanliness of the product, should govern both the price paid by the consumer and that received by the producer.

It is apparent that the methods now prevailing in the trade fail to give these factors the emphasis which their fundamental importance deserves. The minimum legal requirements in the various states are far from uniform, and no well-recognized grades of milk and cream have yet been established in the trade. The farmer receives practically the same price irrespective of the quality of his product; the consumer pays about the same whether the food value of what he buys be high or low. While many farmers and dealers do attempt to base their transactions on the cleanliness and percentage of solids in the product, the lack of any well-defined and recognized standard and the indifference of consumers tends to discourage such

dealings. "Milk" is sold without definite description, and the general result is a lack of incentive to both farmers and dealers to improve their product.

LACK OF ACCURATE KNOWLEDGE OF COSTS AMONG FARMERS

Partly as a result of the absence of a standardized product, partly because of the difficulty and expense of keeping records, farmers now sell their product without accurate knowledge either of its value or its cost to them. This ignorance hinders improvement being made in methods of production and tends to destroy the cordial relations which should exist between the country producer and the city dealer. When the producers fail to prosper, they attribute it to the low prices paid by the dealers. The dealers, on the other hand, are apt to regard as extortion every attempt by the producers to raise prices. To remedy this condition, the producers must acquire an accurate knowledge of their cost of production sufficient to enable them to eliminate waste and to ascertain definitely the minimum price requisite to yield them a profit.

THE LEASED-CAR SYSTEM OF TRANSPORTATION

It has been pointed out in the foregoing pages how the leased-car system tends to give a buying monopoly to the dealer in each producing district. This usually makes it impossible for the farmers to secure competitive bids or to send their product directly to the city market, thereby preventing their obtaining the best price their product can command, and weakening their incentive for improvement.

LACK OF SYSTEMATIC METHODS OF DISTRIBUTION AMONG DEALERS

Dealers generally, especially in the retail trade, have not had the means of ascertaining the exact cost of the different methods of distribution and sale. The throwing of

surplus milk on the market has produced cut-throat competition and has prevented dealers from coöperating in developing systematic methods of distribution. This has resulted in the continued use of wasteful methods, in unnecessary expense, and in general confusion and disorganization costly to all.

THESE CONDITIONS CAN BE REMEDIED

The above conditions must be remedied in whole or in part before the difficulty can be solved. To assist in correcting some of these conditions, suggestions and recommendations are made. **It must be borne in mind that it was by the cooperation of all parties interested that this analysis has been made and that only by cooperation can the following suggestions for improvement be carried out.**

Considering that within the last five years each New England agricultural college has established an extension service, that over forty of our sixty-seven counties have county agents (agricultural advisers), that state and federal agricultural agencies are doing more and more for the farmers, dealers and consumers, and that farmers' associations are being rapidly formed, there is reason to believe that the necessary coöperation to secure these suggested changes can now be had.

SUGGESTIONS AND RECOMMENDATIONS

I. A FIRST-CLASS PRODUCT THE PRIME ESSENTIAL

The consumer demands a good, clean milk and cream. Insistence upon good, clean milk and cream is important for two reasons:

Health.

1. Clean milk and cream is essential for the public health.

2. Clean milk and cream is worth more commercially to the producer, dealer and consumer, because —

Commercially.

a. It will keep a greater length of time, thus protecting distributors and consumers against loss, assuring them a product of greater value, and justifying the producer in asking a higher price.

b. It will increase confidence, thereby increasing consumption, with a resulting benefit to the producer, carrier and dealer.

c. Clean commercial cream will not only keep longer but will make better ice cream, better pastry, better flavoring and better butter.

Among the essential considerations in the production of good, clean milk and cream are —

Important factors.

1. Cow's udders and flanks should be thoroughly cleaned before each milking. (Clipping udder twice or more a year would facilitate this.)

2. Milker's hands and clothes should be clean.

3. Utensils should be clean and if possible sterilized, and a small-mouthed pail should be used.

4. **Milk and cream should be cooled to 50 degrees or less immediately after milking and kept at this temperature.**

Involves extra work. This involves extra labor in the keeping of the cow and painstaking care in milking, as well as the use of cold water or ice. In summer, ice is a necessity.

No special inducement. This extra labor costs money, and the farmer has, therefore, in most instances failed to produce good, clean milk because, despite his increased expense, he would receive no higher price.

II. GRADING AND LABELING

At present no uniform standards. As demonstrated in the preceding pages, there are many different systems upon which milk and cream is bought and sold. The states have varying standards for butter fat, solids not fat, and total solids. The states and municipalities have varying requirements as to sanitary conditions (barn score, bacteria count, etc., etc.). Milk and cream are not officially graded. The farmer is not paid on the basis of butter fat and bacteria count. The consumer has no way of knowing the butter fat and bacteria count in the milk and cream which he buys.

NEW YORK CITY'S PLAN

New York City has a plan by which the sanitary character of milk and cream is designated by grade "A," grade "B" and grade "C." A specified standard for each grade is established for the minimum number of bacteria in the raw stage before pasteurization and also after pasteurization.

Present Standards for Grading in New York City.

	Bacteria Count		
	Before pasteurization	After pasteurization	Barn score
Grade A, raw,	Milk 60,000 Cream 300,000		75
Grade A, pasteurized,	Milk 200,000	Milk 30,000 Cream 150,000	68
Grade B, pasteurized, outside of city,	Milk 300,000 1,500,000 in city	Milk 100,000 Cream 500,000	55
Grade C, pasteurized, manufacturing purposes only,	No limit	Milk 300,000 Cream 1,500,000	40

(All milk and cream except grade "A" raw have to be pasteurized.)

Grade and label. If grading and labeling is to be established here, an important factor would be the enactment of uniform laws and regulations giving boards of health power to issue licenses to dealers and to enforce rules and regulations for grading and labeling.

Designation on label. Every milk and cream container should be labeled as to its butter-fat content and sanitary character under the designations, for instance, of grade "A," grade "B," grade "C." If sold raw, the date of production* could be stamped on the container, or if sold pasteurized the date of production* and of pasteurization.* Every container of milk and cream so labeled would show to the consumer —

1. Its sanitary character.
2. Its butter-fat content.
3. Date of production if raw.
4. Date of production and pasteurization if pasteurized.

Skim milk and buttermilk should be labeled "Skim Milk" and "Buttermilk," with the addition of "A," "B" or "C," to show its sanitary character.

Sour milk should be labeled "Sour Milk."

This will enable the consumer to ascertain exactly what he is buying. The consumer can then choose the grade he wishes and obtain it by paying the current market price.

*Day of week only is necessary.

The producer can then be paid according to the character of the milk he produces (butter fat and bacteria count).

Standardization. It has been suggested that, in view of the great variation in the butter-fat content of natural cow's milk ($2\frac{1}{2}\%$ to 8%), were standardization of milk and cream undertaken, it would make it possible for the consumer to purchase the exact quality of milk (as to its richness in butter fat) which he might desire. Some of the milk and most of the cream sold in New England is now being standardized.

CO-OPERATION OF BOARDS OF HEALTH

Some may contend that small cities and towns cannot inspect and grade milk and cream because of the cost of a laboratory, etc. Attention is called to the coöperative milk inspection and testing laboratory that is carried on jointly by Canton, Needham, Framingham, Wellesley, Weston and Belmont, Massachusetts. By this means it is possible to engage a thoroughly competent man, maintain a good laboratory, and do efficient work, at a proportionate cost which is not prohibitive.

SYSTEM OF BUYING

Uniform buying system. There should be as nearly as possible one uniform system of buying and selling (so much per pound for butter fat and so much per hundredweight for skim milk (solids not fat); and this price should be based on a specified bacteria count). Milk and cream below this specified bacteria count should command a less price. (See bottle diagram.)

Example: Base price. Under 20,000 bacteria, 35¢ lb. butter fat, and 60¢ cwt. for skim milk (solids not fat).

Over 20,000 and under 50,000 bacteria, 33¢ lb. butter fat, and 40¢ cwt. for skim milk.

Over 50,000 and under 100,000 bacteria, 30¢ lb. butter fat, and 20¢ cwt. for skim milk.

These are fictitious prices and standards, for illustration only, but it is substantially the same system used by two of the largest buyers of milk and cream in the country.

This system would be fair to producers, dealers and consumers.

III. PRODUCERS SHOULD ESTABLISH COUNTRY MILK STATIONS

MANY EVILS UNAVOIDABLE IN DIRECT DELIVERY TO THE CAR

Receiving plant for grading and processing.

To grade milk and cream it is practically a necessity to have milk and cream plants. Collections in all directions from the producers could be made by motor trucks or horse teams. The milk and cream of each producer could be weighed daily and a sample taken for butter fat; twice or three times a week tests could be made for bacteria count.

Present system not satisfactory.

The picking up of milk and cream, a few cans at a station, to secure a carload, is unsatisfactory for the producer, railroad company and consumer. It makes it practically impossible to grade the milk and cream. Furthermore, the milk and cream on station platforms is exposed to the sun, and the rise in temperature causes the bacteria to multiply by hundreds of thousands, and lessens the keeping quality of the milk and cream.

Dealer sets price.

At present the general farmer has very little voice in determining the price to be paid for his milk and cream. He takes what the dealer offers, which is generally the price for no special grade of product and is influenced largely by the yearly surplus.

Information on credits.

Proper arrangements as to time of payment also should be insisted upon by the producers. In the exercise of ordinary business judgment the producer

should ascertain the credit standing of any prospective purchaser of his product. If he carries a checking account with his local bank undoubtedly the bank will assist him in securing this credit information and advise him on his collections. The establishment of country plants would simplify the question of credits for the producers.

CARE OF SURPLUS IN THE COUNTRY

Surplus very important factor.

In addition to producing good, clean milk and cream and grading it, the producers, to assure themselves of greater returns for their product, would do well to process it and to make arrangements to care for the surplus. Too much emphasis cannot be laid upon the taking care, in the country, of the surplus; manufacturing it into butter, skim milk or cheese. As pointed out previously, **this surplus item is one of the most serious causes for the present chaotic condition in the industry.**

FUNCTIONS OF THE COUNTRY MILK AND CREAM STATION

Milk plant.

A plant could be built beside the track in each producing territory, to receive milk and cream and perform wholly or in part the following operations:

Processing.

1. Weigh, test and grade.
2. Pasteurize.
3. Separate and standardize.
4. Cool, can and bottle.
5. Make butter and condense, or otherwise utilize the surplus and the skim milk.

Where these plants are located in the vicinity of small cities or large towns, local deliveries can be arranged either directly by the manager of the plant or through dealers who will obtain their supply from these plants.

In many places, this milk could be transported by motor truck very advantageously; but it would be wise usually to have the plant beside the track to receive coal and to ship the surplus.

COST OF PLANT AND SUGGESTIONS FOR FINANCING AND MANAGEMENT

How money may be raised. A plant, well built and equipped, would cost from $2,000 to $20,000, according to its capacity and the number of operations carried on. The plant could be owned by the farmers and business men of the locality. Money could be raised by the issuing of non-voting preferred shares to the business men and investors locally, and voting common shares to the farmers.

Directors. A directorate of five in number might be composed of three farmers, one business man and the cashier or treasurer of a local bank.

Reason for previous failures. Coöperative creameries have failed in the past largely because of inefficient management (a poor bookkeeping system, no allowance for depreciation, no allowance for surplus, no safeguard preventing one or two persons from gaining control of the company, and the lack of knowledge of new methods of testing, manufacturing and marketing).

Careful survey of local conditions. The directors should give careful thought to all local conditions before making arrangements for the exact type of plant needed by the locality. Arrangements can then be made for the collection and grading of the milk and cream. The company may then process its own milk and cream and sell to a dealer a specified amount, taking care of its own surplus in the form of cream, butter or cheese; or it may lease the plant to a dealer at a specified figure for the entire output.

BENEFITS TO BE ANTICIPATED

Fixing the price. The producers would then have facilities for the disposal of their product in the manufacturing of butter or cheese, if they are unable to secure satisfactory prices from the dealers.

Producers may look forward to receiving more for their product when they cease to allow others to furnish them their cans, to collect (taking all grades, little or much), to dictate price and to process, grade and market their milk and cream.

Railroad companies can assist.

We believe that the railroad companies should do all in their power to encourage the farmers and business men of each locality in the building of milk stations.

Value of a milk plant to community.

A milk plant is important to the prosperity of the community. A certain small plant, not well equipped or managed, in one of our New England localities, paid the farmers last year nearly $100,000, which brought as much money into the community as many manufacturing establishments employing one hundred and fifty to two hundred men each.

It is obvious that, if the farmers, business men, bankers and railroad company of a given community are not interested in the building of such a plant for the benefit of their own locality, they should hardly expect outsiders to perform this service for them.

MANUFACTURING CREAMERIES DESIRABLE IN REMOTE DISTRICTS

In distant localities, cream or butter more profitable.

In localities far from the railroads, it is doubtful if the farmers should try to sell fluid milk. It would be more profitable to put up a plant to separate, and either sell cream or make butter or cheese. There is a large market in New England for good fresh-made butter, and cheese. Buying cream on grade would further the making of good butter. (This is well demonstrated by the results obtained by three Vermont coöperative creameries, which, with the assistance of the State Commissioner of

Agriculture, had an expert from the Dairy Division of the United States Department of Agriculture to advise and assist in grading and manufacturing.)

CO-OPERATION OF PLANTS FOR EFFICIENCY

There is no reason why several of these plants should not coöperate in the hiring of an expert to supervise. By the plants buying supplies collectively and studying the cost of operation, the manufacturing expense could be kept down and any new methods of manufacturing or operating could be taken advantage of.

IV. IMPROVEMENTS IN FARM ECONOMY

IMPORTANCE OF SKIM MILK ON THE FARM

Value of skim milk.

The value of skim milk for the feeding of calves, hogs and poultry has never been accurately determined, and is very little appreciated by the farmer.

1. He does not know how to feed skim milk properly in combination with grain and grass feeds to realize the most from it per hundred pounds.
2. He markets his calves, hogs, poultry and eggs in such a way as to realize very little cash for his skim milk largely because of his failure to properly prepare and grade his product.

It may be that in the near future these milk plants will serve in this connection as a means for the grading and marketing of eggs and poultry.

IMPORTANCE OF MANURE ON THE FARM

Considering not only the necessity of conserving the fertility of the soil but also of realizing the largest return from each one of the three products of the cow, — milk, calf and manure. It is surprising that serious efforts have not been directed previously toward ascertaining definitely the value of cow manure to the soil, and the effects of various kinds of bedding on the soil. In this the experiment stations may be of great assistance to the farmers.

PRODUCERS MUST KNOW THE COST OF PRODUCTION

The producer must know, first, how much it costs to keep his herd, and from this he can easily determine what it costs him to keep a cow. The record of production and butter-fat content should be kept for each individual cow, as well as the value of the calf and average value of manure, to determine the following items:

1. Whether he is feeding efficiently — feeding right rations and in right combinations.

2. Whether he is breeding properly.

3. Whether the cow is producing enough milk and butter fat to make her profitable.

With a perfect understanding and appreciation of these items, the farmer will not be willing to sell his milk for less than it costs him to produce it; not understanding these items, he may unknowingly sell his article at a loss.*

CO-OPERATION IN STUDYING COST OF PRODUCTION

Necessity for records.

The operations in the raising of crops on the average farm are not large enough to justify the hiring of a bookkeeper or accountant. The average farmer is too busy and many times too tired after his work to keep his own books.

Cow test associations, weighing and figuring clubs.

Producers may come to know these items of cost through cow test associations in localities where there are enough cows to warrant them. In localities where there are not enough cows to warrant these associations, clubs or associations for weighing and figuring can be worked out by the farmers in co-operation with the county agent,

* (From Conn. Dairymen's Association Secretary's Report, January 1, 1915, mentioning the conditions existing among the Connecticut dairymen.)

"A few, to be sure, are making good and seemingly are content, but there are too many of our dairymen who do not realize the actual cost of the milk, cream or butter they produce, and for this reason are in no position to demand a price for their products to yield them a reasonable profit.

"This lack of knowledge should not exist in this age of progress. It has a tendency to lower the prices as a whole and puts dairying on a level with the most ignorant producer."

Extension Service of the Agricultural College, State Department of Agriculture, or the Dairy Division of the United States Department of Agriculture. This is a prerequisite to improvement, as the production of milk, calves and manure is as distinct a business in itself as the operation of the land for the raising of crops.

Suggestions for co-operative bookkeeping.

Cow test associations have been exceedingly useful. Usually twenty-six or more farmers combine in employing a man to weigh and test their milk and feed, and advise them of more efficient methods of feeding and breeding. It is possible that in a given locality farmers can combine in units of ten, fifteen or more, and have the same man who tests the cows keep books showing the essential operations in the crop management of the land and other live-stock items; or a cow test association might employ an extra man to keep the books. The dividing up of expense in this way among several farmers will bring the cost down to a point where no farmer can afford to be without such service.

Cow test associations in New England.

In Northern Vermont, there are fifteen farmers who are employing, in addition to a cow-tester, an agricultural college graduate who advises them as a consulting engineer would a mercantile, railroad or mining company. These farmers are prosperous. They have probably better records than in any other section of New England. (Vermont has already 34 cow test associations; New Hampshire, 5; Massachusetts, 4; Maine, 5; and Connecticut, 1.)

Co-operation to carry out recommendations.

Boards of trade, chambers of commerce, merchants' associations, farmers' associations and county agents should encourage the keeping of pure-bred sires by the farmers in their locality and strive to increase yearly the percentage of pure-bred cows. They should also see to it that cow

test associations are formed, weighing and accounting clubs or associations are formed, and that there is a satisfactory plant in the district for the sale of milk and cream.

Farmers to organize locally.

Producers must first organize in local communities before they can work effectually together as a county, state or New England unit. A difficulty of the farmers' milk producers' organizations in the past has been the covering of a wide territory, including so many communities that were scarcely organized. Furthermore, their local branch organizations had no plants to which to deliver milk and cream, but were obliged to sell direct to the dealers. With these handicaps it was almost impossible to accomplish anything definite.

Federation of local organizations.

As local communities become organized, they can combine into a section, county, state and New England organization, to be kept fully informed as to proper legislation, methods of manufacture and transportation, and prices to be paid and received in the different sections.

(From Editorial in the *Saturday Evening Post* of December 20, 1913, quoting Mr. Howard Elliott, President of the N. Y., N. H. & H. R. R.)

"In the last census year Connecticut manufacturers produced two hundred and thirty-three million dollars, and Connecticut agriculture — including some duplications — only thirty-seven million dollars. That proves, we should say, that manufacturing is more profitable than agriculture, — but profitable to whom? Probably not to a great many of the two-hundred-and-odd thousand wage-earners who, with their dependents, make up the larger part of the state's population.

"There is opportunity for thousands of those wage earners on Connecticut's uncultivated or half-cultivated land; and they would be there if half the organizing talent directed to Connecticut manufactures had been directed to Connecticut agriculture.

"'There are at least two reasons for the success of Danish agriculture,' says Mr. Elliott. 'One is the intensity of agricultural effort; the other is the resort to coöperation among farmers. In Denmark the farmers have coöperative dairies, coöperative slaughter houses, and coöperative societies to export live stock and eggs. Of the total milk production, seventy-seven per cent comes from coöperative dairies.'

"By coöperative organization, such as exists in Denmark, Connecticut agriculture can succeed, too."

V. REFORM IN RAILROAD TRANSPORTATION

A. BAD RESULTS OF EXISTING METHODS

There are now practically four ways of transporting milk and cream in New England.

Present systems.

1. Express.
2. Excess baggage.
3. Leased car.
4. Per can rate, the railroad company loading, unloading and icing the car. (Massachusetts Saunders Law.)

Wide differences in present systems and rates.

Some roads charge the same rate for milk and cream; others charge a higher rate for cream. Some roads have one rate for shipping, — a passenger or freight rate; others allow a reduction of 25% for any shipments in freight service. Some rates are computed on a zone basis; others on a flat, per-mile basis.

Producing and consuming sections.

The great milk producing territory is Maine, New Hampshire, Vermont, Quebec and eastern New York. The great consuming territory is the one hundred and sixty-three incorporated cities and towns in Massachusetts, Rhode Island and Connecticut, which have a population of between five and six millions.

Express and baggage.

It is probable that cream and some milk will always be shipped by express. Efforts should be bent toward securing good containers that may be insulated or covered to keep the temperature down. Some cream and probably some local milk will be shipped as excess baggage, but in general this method is unsatisfactory because of the high temperature in summer and the difficulty in grading.

Leased car system has made bad conditions.

The leased car system, which is the system under which the greater part of the milk and cream in New England is transported, has tended to give the dealers a monopoly of the

buying territory, and in 75% of the localities this condition already exists. (See map at end of book.) With the exception of about 25% of the localities, the farmer has had to accept what the dealer has offered, and it has been impossible to secure competitive bids. This tends to build up an antagonism between the farmer and the dealer, making it less probable that the farmer will strive to produce for the dealer a good, clean article.

An exceedingly bad condition exists when the producers of any one section are unable to reach the consuming centers at a rate and with service somewhere near as satisfactory as the dealer, and are not able to invite competitive bids for their product.

Operation of Saunders Law.

The so-called Saunders Law, enacted in Massachusetts in 1910, compels the railroad to load, unload and ice milk and furnish the same rate per can for one can as for one thousand cans. This operated distinctly against the Massachusetts farmer, as the large dealers immediately went into Maine, New Hampshire and Vermont, Quebec and eastern New York, where, as interstate business, they could lease a car and bring in milk at a much lower rate from the sections where it could be bought more cheaply.

B. RAILROADS SHOULD CARRY MILK FOR ALL AT UNIFORM RATES

Abolish leased car system and establish per can rate.

The leased car system should be abolished. Representatives of the New York, New Haven & Hartford Railroad Co., Boston & Albany, Boston & Maine, Maine Central, Central Vermont, Rutland Railroad, Delaware & Hudson, and Canadian Pacific could meet and arrange a uniform rate for milk and cream per can, based on a zone or flat rate per mile, the railroads performing the loading, unloading and icing. The rate for milk should be lower than that for

cream. All deductions on account of freight train service should be abolished. The rate for a carload when the shipper loads at not more than two stations in a given section, and does his own icing and unloading, should be at a percentage less than the per can rate.

The rates should be uniform throughout New England. This will enable groups of farmers to ship to the market at an equal advantage with the dealers, or to secure competitive bids from the dealers.

System satisfactory elsewhere.

This is substantially the same system that is in vogue on the Pennsylvania, New York Central and Canadian Pacific roads. Some dealers in New England claim that the railroad cannot properly take care of the milk and ice it. The fact that it is done satisfactorily in other parts of the country is evidence that it can be well done here.

Importance of temperature.

State and local boards of health should prohibit the shipment of milk and cream at a temperature above a fixed maximum. The railroads should not be expected to reduce the temperature of milk and cream in transit. The establishment of country milk plants will greatly facilitate the carrying out of this recommendation.

VI. IMPROVEMENT IN CITY DISTRIBUTION

A. CO-OPERATION AMONG DEALERS

Dealers' co-operative organization.

Competition among dealers in Boston is so strong as to point to animosity in some instances. While there should be keen competition, there is no reason why the dealers should not have an organization and meet regularly to discuss subjects

of mutual interest, viz., return of lost bottles, loss in bad bills, use of ticket system, grades, standards, etc., etc. These items are of vital interest to all, and, so long as prices are not discussed, the danger of being accused of combining would be very remote, and there would be little likelihood of disagreements among members of the organizations. No one company should be allowed to control the trade. The animosity existing among the dealers is not only detrimental to themselves, but to the public as well.

B. SOME METHODS FOR REDUCING COSTS

Wholesale and retail store delivery fairly efficient.

In the analysis of distribution it was shown that the cost of delivery to wholesale trade in cans was averaging $\frac{1}{2}¢$ per quart; to retail stores, in cases of bottles, $1¢$ to $2¢$, with an average of $1\frac{1}{2}¢$; and to family trade, $2\frac{1}{4}¢$ to $5¢$, with an average of about $3¢$ or $3\frac{1}{2}¢$.

It is difficult to see how the cost of delivery to the wholesale trade may be reduced. A possible small saving might be made in the delivery to the retail store by the use of motor trucks and two-horse teams.

Use of tickets an aid in cutting cost to family trade.

The cost of delivery to the family trade might be reduced by the introduction of the ticket system which has worked successfully in the West and some cities in New England, as well as in Montreal and Toronto, Canada, where large amounts of milk are delivered to the family trade. The consumer pays a dollar or even less for tickets which he puts out each day in the empty bottles for the amount of milk and cream he wishes. This assures to the dealer his money in advance, prevents loss by bad bills, and secures the return of his bottles daily. It also simplifies bookkeeping. The ticket system will enable the price of milk and cream to the consumer to be raised or lowered in

fractions of a cent. At present it can be done only in units of our smallest coin (one cent). The success of the ticket system depends upon the coöperation of a majority of the dealers and the consumers.

Service costs money. If the consumer wishes his milk and cream delivered at his door, the regular amount and extra amount as he desires it, and does not pay special attention to the return of the bottles and is not willing to put out tickets, then he must expect to pay a higher price to cover the cost of this service — loss in bottles, loss by bad bills, additional cost of bookkeeping, etc., for this must be charged pro rata to the consumer in the price per quart. If the consumer obtains his milk and cream at the retail store and returns the bottle, he is performing part of the service of delivery and should obtain his milk at a lower price than if it were delivered to him. In congested districts, this is the most economical method of handling milk and cream.

Municipal or central delivery. The suggestion for a municipal or central delivery company has never been tried in practice, and an experiment alone would prove whether it would be satisfactory. The advisability of its establishment would of course depend upon peculiar local conditions. (Refer to discussion on page 32.)

C. BETTER COST ACCOUNTING

Cost accounting. **If the dealers, large and small, were to install better systems of bookkeeping and cost accounting, they would know the exact variation in the cost items and the reasons for the variations. They should also be constantly informed of new methods in processing, testing, etc. Small dealers can co-operate,as can the producers, in having their bookkeeping and testing done. In doing this, they can more successfully compete with the large dealer.**

VII. ADVERTISING THE FOOD VALUE OF MILK AND ITS PRODUCTS

Food value. Milk, cream, skim milk, buttermilk and butter are among the best and cheapest foods on the market. Like other food products, they should be advertised. As producers become organized, they can join with the dealers in the advertising of the food value of milk and its products.

Skim milk. Skim milk is simply milk with the fat extracted, but containing all other solids. (See diagram of quart of milk.) It has a food value which has never been properly emphasized. Its value for drinking and cooking purposes should be brought to the attention of the public by proper advertising.

Confidence essential. To restore and increase the confidence of the consumer in their product, the producers, carriers and dealers must see to it that their milk is clean and properly graded. This will facilitate the education of the public in the food value of milk and its products and will lead to an increased demand, to the ultimate benefit of producer, carrier and dealer.

VIII. IS THE PRODUCER TO GET MORE FOR HIS PRODUCT?

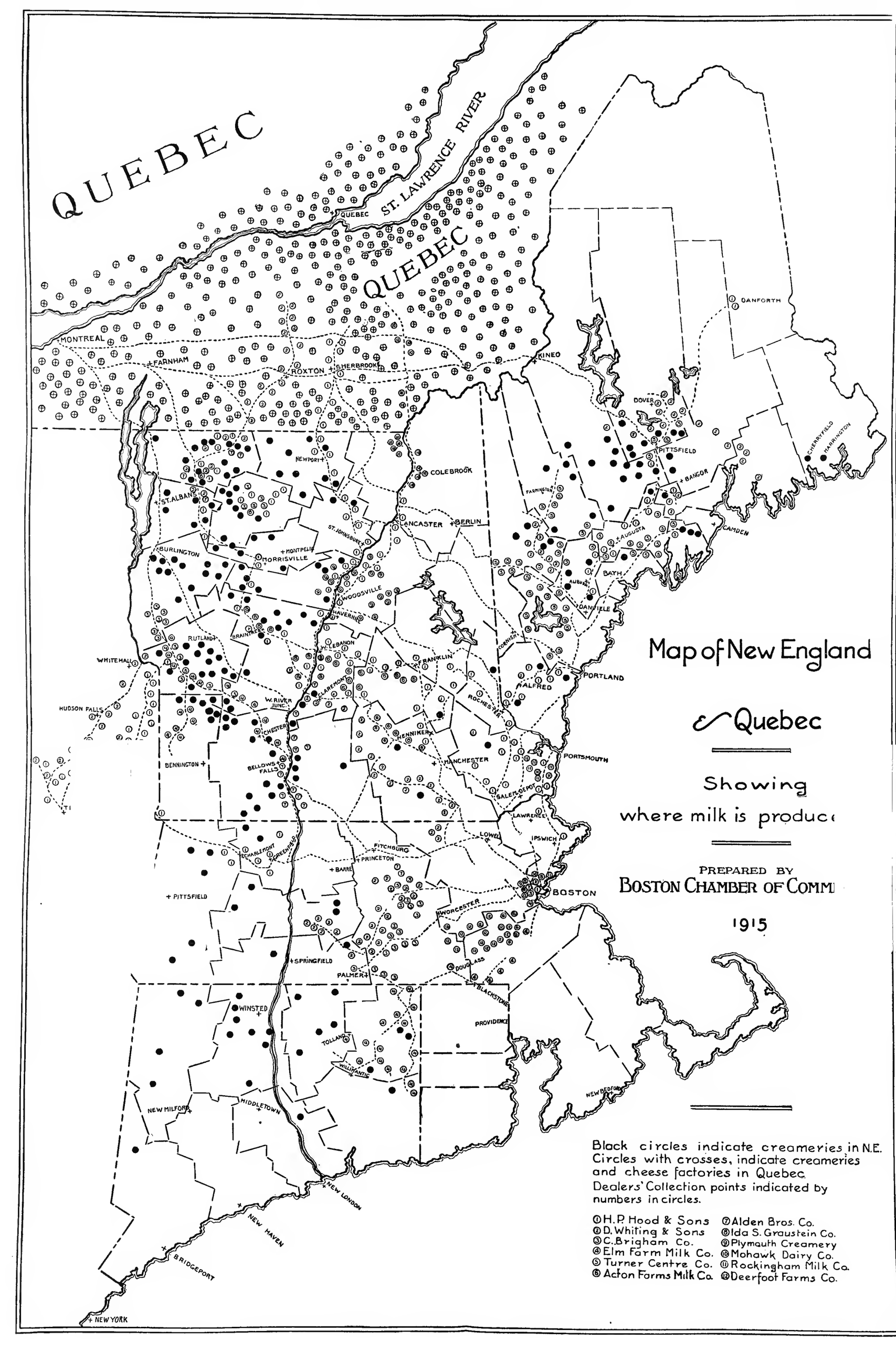
Must grade, process and care for surplus. The question of the producer getting more money depends largely on the grade of his product and his ability to process and market it. It is improbable, as long as the producer operates individually, as he is now doing, that he can secure more for his product.

Importance of carrying out recommendations.

Were the suggested recommendations carried out, there is reason to hope for a substantial increase in prosperity among New England farmers and dealers, and for securing to our large consuming population a good, clean, fresh product of milk, cream and butter, at reasonable prices.

If agitation, individualism and lack of coöperation continue, the dairy business in New England will materially suffer, thus not only seriously affecting the bankers, merchants and railroads dependent upon the farmer for trade, but also reacting upon the prosperity of the large centers of trade in New England. An average increase of even $100 per year in the individual incomes of our New England farmers will add, roughly speaking, $20,000,000 per year to our general prosperity.

Business means prosperity.



Map of New England & Quebec

Showing where milk is produce

PREPARED BY
BOSTON CHAMBER OF COMM

1915

Black circles indicate creameries in N.E. Circles with crosses, indicate creameries and cheese factories in Quebec. Dealers' Collection points indicated by numbers in circles.

① H. P. Hood & Sons
② D. Whiting & Sons
③ C. Brigham Co.
④ Elm Farm Milk Co.
⑤ Turner Centre Co.
⑥ Acton Farms Milk Co.
⑦ Alden Bros. Co.
⑧ Ida S. Graustein Co.
⑨ Plymouth Creamery
⑩ Mohawk Dairy Co.
⑪ Rockingham Milk Co.
⑫ Deerfoot Farms Co.

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